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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,562	02/23/2002	Christopher P. Townsend	115-002	3189

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EXAMINER	
COHEN, AMY R	

ART UNIT	PAPER NUMBER
2859	

DATE MAILED: 01/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/082,562	TOWNSEND ET AL.	
	Examiner	Art Unit	
	Amy R Cohen	2859	MW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 October 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-~~14~~ 41 and 43-106* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-41 and 43-106* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a)☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see Amendment, filed 23 October 2003, with respect to the rejection(s)of claim(s) 1, 3-41, 43-99 under Brann, Hutchings, and Sheldon have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Hansen, Hutchings, and Brann.

Claim Objections

2. Claims 21, 23, 24, 28, 31, 39, 62, 64, 65, 69, 72, 80, 105, and 106 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

The above claims do not provide structure which further limits the apparatus as claimed in the claims from which claims 21, 23, 24, 28, 31, 39, 62, 64, 65, 69, 72, 80, 105, and 106.

3. Claim 83 is objected to because of the following informalities:

Claim 83, line 3 "the spine" should be --a spine of the living subject--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 3-6, 8-11, 13-15, 17-19, 25-32, 39-46, 48-52, 54-56, 58-60, 66-73, 80-85, 88-94, 96, 97, 99-102, 105, and 106 are rejected under 35 U.S.C. 102(b) as being anticipated by Hansen (U. S. Patent No. 5,744,953).

Hansen teaches a device (15) for attaching to a living subject (1) having a joint (Fig. 3), comprising a first sensor (25), a second sensor (25), a processor (55, 21), and a non-volatile storage device (21), said first sensor for attaching to a first body segment above the joint, said second sensor for attaching to a second body segment below the joint (Fig. 3), wherein said first sensor and said second sensor each comprise a solid state inclination measuring device for determining inclination with respect to the gravity vector (Col 4, line 58-Col 5, line 46), wherein said inclination with respect to the gravity vector determined from said first sensor and from said second sensor is processed in said processor and stored in said non-volatile storage device (Col 5, lines 35-65) for distinguishing lying, sitting, and standing positions, wherein said processor and said non-volatile storage device are part of the device for attaching to the living subject.

Hansen teaches the device wherein said inclination measuring device comprises a dc accelerometer (41, 43).

Hansen teaches the device wherein said inclination measuring device comprises three accelerometers orthogonally mounted (Col 7, lines 1-7).

Hansen teaches the device wherein said inclination measuring device comprises a magnetometer (25, Col 5, lines 1-7).

Hansen teaches the device wherein said inclination measuring device comprises a plurality of magnetometers (25, R1-R9, Figs. 1-3, Col 5, lines 1-7).

Hansen teaches the device wherein data from said first sensor is subtracted from data from said second sensor (Col 5, lines 8-34).

Hansen teaches the device wherein said subtraction is to determine a difference in orientation (Col 5, line 8-Col 6, line 67).

Hansen teaches the device wherein said first sensor and said second sensor are for measuring range of motion of said second body segment with respect to said first body segment (Col 5, line 35-Col 6, line 67).

Hansen teaches the device wherein data from said range of motion measurement is analyzed for change of range of motion over time (Col 6, lines 61-67).

Hansen teaches the device wherein said non-volatile storage device comprises a solid state device (21).

Hansen teaches the device wherein said non-volatile storage device comprises a non-volatile memory chip (21).

Hansen teaches the device further comprising a feedback device (in 21, Col 5, lines 8-34).

Hansen teaches the device comprising a housing (21) separate from said first sensor and said second sensor, wherein said feedback mechanism in within said housing (Fig. 1).

Hansen teaches the device wherein said first sensor and said second sensor are wirelessly connected to said housing containing said feedback mechanism (Col 9, lines 38-44).

Hansen teaches the device wherein said wireless connection is an RF connection (Col 9, lines 38-44).

Hansen teaches the device wherein said processor comprises a microprocessor (55), a signal processor (55), or personal computer (21).

Hansen teaches the device wherein data from said inclination determination comprises body segment inclination data as a function of time (Col 6, lines 55-67).

Hansen teaches the device wherein data from said inclination determination comprises posture data as a function of time (Col 6, lines 30-67).

Hansen teaches the device wherein data from said inclination determination is used to adjust physical therapy, for recording presence of pain, for determining body posture in said sitting position, for distinguishing bending in one said position, for distinguishing forward bending, backward bending, or lateral bending (this is intended use, the programs described in Col 5, lines 2-34 and Col 9, line 45-Col 10, line 14 could perform this function).

Hansen teaches the device comprising a data entry system (Col 5, lines 8-34).

Hansen teaches the device where said data entry system comprises a button (21, Col 5, lines 8-34).

Hansen teaches the device wherein time, date or other data are recorded when said data entry system is used (Col 5, lines 8-34 and Col 6, lines 61-67).

Hansen teaches a device comprising a solid state sensor (25, 41, 43), a processor (55, 21), a non-volatile storage device (21), and a feedback mechanism (Col 5, lines 8-34 and Col 9, line 45-Col 10, line 14) wherein data from said sensor is processed in said processor to provide an output, wherein said output is stored in said non-volatile storage device as a function of time, and wherein multiple points of said time dependent output stored in said non-volatile storage device are processed in said processor, wherein said processor is programmed to direct said feedback mechanism to provide information or instruction in response to said multiple points of time dependent output indicating inactivity, or activity of a joint during an interval of time that is less than a preset level of activity, or a range of motion of a joint during an interval of time that is less than a present range of motion or vibration during an interval of time that is greater than a preset amount of vibration (Col 5, lines 8-57 and Col 9, line 45-Col 10, line 14).

Hansen teaches the device comprising a network of solid state sensors (Figs. 1-3).

Hansen teaches the device wherein a first solid state sensor of said network of solid state sensors is for placing on a first body segment and a second solid state sensor of said network of solid state sensors is for placing on a second body segment connected to said first body segment (Fig. 1-3).

Hansen teaches the device wherein data from said first sensor is subtracted from data from said second sensor to provide angle of a joint there between (Col 5, line 8-Col 6, line 67).

Hansen teaches the device wherein said first sensor and said second sensor are for measuring a range of motion of said second body segment with respect to said first body segment (Col 5, line 8-Col 6, line 67).

Hansen teaches the device comprising a housing (17, 21) separate from said sensor wherein said feedback mechanism is within said separate housing.

Hansen teaches the device wherein said storage device and said processor are within a housing, wherein said storage device and said processor are within the same housing (21, host computer, houses both a storage device and processor).

Hansen teaches the device wherein said output comprises body segment orientation as a function of time (Col 6, lines 56-67 and Col 9, line 45-Col 10, line 14).

Hansen teaches the device wherein said device is wearable (Figs. 1-3).

Hansen teaches a device (15) for attaching to a living subject (1), comprising a first sensor (25), a processor (21, 55), and a storage device (21), wherein said first sensor comprises a device for determining a curvature of the spine, wherein data from said sensor is processed in said processor and stored in said storage device, wherein said first sensor, said processor and said storage device are part of the device for attaching to a living subject (Figs. 1-3 and Col 5, lines 1-59).

Hansen teaches the device wherein said device is capable of detecting various postures based on curvature of the spine, capable of detecting a kyphotic curvature of the spine or a lordotic curvature of the spine (this is intended use, the programs described in Col 5, lines 2-34 and Col 9, line 45-Col 10, line 14 could perform this function).

Hansen teaches the device comprising at least one additional sensor (25, 41, 43) for attaching to the subject for distinguishing lying, sitting and standing positions (Col 5, line 35-Col 6, line 67).

Hansen teaches the device wherein said at least one sensor includes a solid state inclination measuring device (41, 43) for determining inclination with respect to the gravity vector.

Hansen teaches the device wherein said at least one additional sensor includes a first inclination measuring device and a second inclination measuring device, said first inclination measuring device for attaching to a first body segment above a joint, said second inclination measuring device for attaching to a second body segment below a joint (Figs. 1-3).

Hansen teaches the device wherein said joint is a hip joint (Figs. 1-3).

Hansen teaches a device (15) comprising a first sensor (25) for placing on a first body segment, a second sensor (25) for placing on a second body segment, a processor (55, 21), a storage device (21), and a feedback mechanism (Col 5, lines 8-34) wherein data from said first and said second sensors is processed in said processor to provide an output, wherein said output is stored in said storage device as a function of time (Col 5, lines 8-59), and wherein multiple points of said time dependent stored in said storage device are processed in said processor, wherein said processor is programmed to direct said feedback mechanism to provide information or instruction in response to said multiple points of time dependent output (Figs. 1-3 and Col 9, line 45-Col 10, line 14).

Hansen teaches the device wherein said processor is programmed to direct said feedback mechanism to provide information or instruction in response to said multiple points of time dependent output indicating inactivity, or activity of a joint during an interval of time that is less than a present level of activity, or a range of motion of a joint during an interval of time that is less than a preset range of motion or vibration during an interval of time that is greater than a preset amount of vibration (Col 9, line 45-Col 10, line 14).

Hansen teaches the device wherein said sensor are for determining posture, wherein said processor is programmed to provide feedback based on time duration the subject has been in a posture and spine curvature (this is intended use, the programs described in Col 5, lines 2-34 and Col 9, line 45-Col 10, line 14 could perform this function).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 7 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen.

Hansen discloses the device as described above in paragraph 5 and wherein the transmitter (23) creates a magnetic field from which the sensors provide data (Col 5, lines 8-34).

Hansen does not disclose the device wherein data from said magnetometers is specifically for providing direction with respect to the earth's magnetic field.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmitter of Hansen to produce a magnetic field which would simulate

the earth's magnetic field, since the transmitter can produce a range of magnetic fields and so that the data gathered will mirror data that would be recorded in non-laboratory areas (Col 9, lines 54-57).

8. Claims 12 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen.

Hansen discloses the device as described above in paragraph 5 and wherein an algorithm is used to process data (Col 5, lines 8-34).

Hansen does not disclose specifically that initial values of time dependent data are tared out to provide change from initial values.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to ensure that the initial values are tared out in the algorithm, since taring out initial values ensures that the program reflects accurate information.

9. Claims 16, 20, 21, 23, 24, 33-38, 57, 61, 62, 64, 65, 74-79,86, 87, 95, 98, 103, and 104are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen in view of Hutchings (U. S. Patent No. 6,305,221).

Hansen discloses the device as described above in paragraph 5.

Hansen does not disclose a device wherein a first sensor, storage device, processor, and feedback mechanism are all within a housing, wherein the feedback mechanism provides vibratory or auditory feedback, wherein the feedback mechanism provides feedback to warn of a problem, discourage a movement, support a desired result, or encourage movement, wherein the problem comprises repeatedly exceeding a pre-programmed inclination angle; comprising a program for displaying data from inclination determination as a histogram showing number of inclinations at each angle range during a time period, comprising a program for displaying data from said inclination determination as inclination v. time; comprising a digital filter comprising a low pass or a high pass filter; wherein the digital filter is for reducing the effects of the linear

accelerations on the data, comprising a high pass filter processes output of the accelerometers which is subsequently integrated and used to compute a resultant velocity which is used to calculate energy used.

Hutchings discloses a device (Fig. 12) wherein a first solid state inclination measuring device (sensor), a non-volatile storage device (Col 25, lines 1-4), a processor (64), and a feedback mechanism (68) are all within a housing (Col 20, lines 26-48), wherein the feedback mechanism provides vibratory or auditory feedback (364), wherein the feedback mechanism provides feedback to warn of a problem, discourage a movement, support a desired result, or encourage movement, wherein the problem comprises repeatedly exceeding a pre-programmed inclination angle, comprising a program for displaying data from inclination determination as a histogram showing number of inclinations at each angle range during a time period, comprising a program for displaying data from said inclination determination as inclination v. time (providing feedback to warn of a problem, etc and providing programs which could graph the data is intended use as discussed above in paragraphs 2 and 5; Hansen suggests using the device to monitor movements over time in Col 5, line 35-Col 6, line 67 and Col 9, line 45-Col 10, line 14; Hutchings also suggests using the device to monitor movements over time in Col 25, line 39-Col 26, line 44; therefore these devices could be used to perform this function and to create graphs from this data since displaying data in the form of a graph is well-known in the art).

Hutchings discloses the device comprising a digital filter (53) comprising a low pass or a high pass filter; wherein the digital filter is for reducing the effects of the linear accelerations on the data, comprising a high pass filter processes output of the accelerometers, (Col 23, lines 33-55) which is subsequently integrated and used to compute a resultant velocity which is used to calculate energy used (Col 25, line 39-Col 26, line 44).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Hansen to include a housing containing a sensor, storage device, processor, and feedback mechanism and a digital filter, as taught by Hutchings, so that the device would be more compact, and therefore more easily worn, and so that the data would be more accurate since the digital filter filters erroneous readings form the sensors.

Regarding claims 20, 61, 86, 87, 95, 98, 103, and 104: Hansen and Hutchings disclose a device which monitors movements, etc over time periods and also suggest using such data for analysis (Hansen, Col 5, line 35-Col 6, line 67 and Col 9, line 45-Col 10, line 14; Hutchings, Col 25, line 39-Col 26, line 44). Programming the feedback device, which already includes a display of the data to further indicate activity or inactivity over a period of time, or exceeding limitations a set number of times, is intended use of the programs which could be capable of performing such functions. Furthermore, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. ***Ex parte Masham***, 2 USPQ2d 1647 (1987). Therefore, it would have been obvious to one of ordinary skill in the art to modify the program of Hansen and Hutchings to provide feedback of inactivity or activity over a period of time or period of "events" (i.e., exceeding a preset range of motion) since providing this feedback would enhance the analysis of the data for the user.

10. Claims 22 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen and Hutchings as applied to claims 1, 3-41, 43-106 above, and further in view of Brann (U. S. Patent No. 6,059,576).

Hansen and Hutchings disclose the device as described above in paragraph 9 and comprising a feedback mechanism.

Hansen and Hutchings do not disclose the device wherein the feedback mechanism comprises a piezo-electric buzzer or an electromagnetic shaker.

Brann discloses a device comprising a feedback mechanism wherein the feedback mechanism comprises a piezo-electric buzzer or an electromagnetic shaker (Col 4, lines 22-25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the feedback mechanism of Hansen and Hutchings to include a piezo-electric buzzer or an electromagnetic shaker, as taught by Brann, so that the user would be able to sense information from the feedback mechanism.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patent discloses a monitoring device Fulton (U. S. Patent No. 5,390,104).

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amy R Cohen whose telephone number is (703) 305-4972. The examiner can normally be reached on 8 am - 5 pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. Gutierrez can be reached on (703) 308-3875. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

ARC
December 31, 2003

Christopher Fulton
Primary Examiner
Tech Center 2800